REMARKS

Claims 1, 5, 6, 8, 10 and 11 stand rejected under 35 U.S.C. §102(b) as being anticipated by United States Patent No. 4,722, 378 to Carolla et al. Applicant respectfully traverses this rejection.

Applicant respectfully submits that the Carolla et al. reference fails to disclose or suggest the specific relationships of the second land portion of the present invention. Basically, the specific relationships defined in independent Claims 1 and 8 result in an outer end of a second land portion (from the outer side of a tire mounted on a vehicle) that is sunk radially inwardly with respect to the tread surface. Examples of such a sunken surface can be seen when comparing the radial height of intersection P with that of depth D, as shown in Figures 2-4, or when comparing the radial height of intersection P with tread surface C0 of Figures 5 and 7-9. In other words, the inner wall of the groove 2 that is between the first and second lands on the outer side of the tire will be of a lower height than the outer wall of that groove.

Such a configuration results in more even distribution of the ground contact pressure on the second land portion when turning because high ground contact pressure on the outer edge of the second land is avoided. Thus, uneven wear is reduced. Further, turning performance is improved because the inner side edge of the second land will not lift or slide during turning, which previously could have resulted from the high pressure on the outer side edge of the second land.

As can be seen in Figures 9 and 10 of Carolla et al., the tire of this reference lacks the basic claimed configuration in which the outer edge of the second land portion (from the outer side of a tire mounted on a vehicle) is sunk radially inwardly with respect to the tread surface, as discussed in more detail below. Specific examples of embodiments defined by the claims will be discussed next.

First, with regard to independent Claim 1, one example of an embodiment defined by this claim is shown in Applicant's Figures 1 and 2, which embodiment includes an outer side M, main grooves 2, and a land portion 3A located second from the outer side of a tire mounted on a vehicle. As can be seen in Figure 2, land portion 3A includes a first circular arc C1 (of radius R1) on an inner edge thereof (edge 3A2) and a second circular arc C2 (of radius R2) connected thereto on the vehicle outer side M. As can also be seen in Figure 2, the second circular arc C2 (which is located closer to the vehicle outer side M) has a smaller curvature radius R2 than radius R1 of the first circular arc C1. Further, circular arc C2 is also positioned more inwardly from the tread surface C0 than the first circular arc C1.

As can also be seen in Figure 2, depth "d" and depth "D" are both indicated. Depth "D" is the groove depth of the wall of groove 2 that faces outer sidewall surface 3y (which, in Figure 2, is the depth of the right-side wall of groove 2 of Figure 2). Depth "d" is the depth from the tread surface C0 of an intersection of the second circular arc C2 at the vehicle outer sidewall surface 3y of the second land 3A (which, in Figure 2, is the difference between the depth of the left wall 3y of groove 2 and the depth of the right wall of groove 2). Thus, as can be seen in the Figure 2 embodiment, the inner wall 3y (shown towards the left,

in this figure) of the second groove 2 is shorter than the outer wall (shown towards the right) of the same groove, which is a result of the claimed configuration of the first circular arc and the second circular arc, as defined in independent Claim 1. Further, Claim 1 also defines the ratio of the depths d/D as being between 0.02 and 0.1.

In order to aid in the Examiner's understanding of Claim 1, following is an annotated version of amended Claim 1 that includes bracketed references to the index numbers of Figures 1 and 2:

> 1. (Currently Amended) A pneumatic tire having a tread surface [1] having a plurality of main grooves [2] extending straight in a circumferential direction of the tire, land portions [3] extending in the tire circumferential direction being defined by the plurality of main grooves [2], the land portions [3] each having a ground contact surface [3x] comprising a first circular arc [C1] having a single curvature radius [RO] in tire meridian cross section,
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> wherein the ground contact surface [3x] of at least the land portion [3A] which is located second when counted from the outer side of a vehicle [M] when the tire is mounted thereon, is arranged so as to have the first circular arc [C1] and at least a second circular arc [C2] connected thereto on the vehicle outer side thereof [M], wherein the circular arc [C2] located closer to the vehicle outer side [M] has a smaller curvature radius and is positioned more inwardly away from the tread surface [CO], and wherein the ratio d/D of the depth d, from a thread surface, of an intersection of the circular arc [C2] located closest to the vehicle outer side [M] with a vehicle outer sidewall surface [3y] of the second land portion [3A] to the groove depth D of the main groove [2] facing to the vehicle outer sidewall surface [34] is 0.02 to 0.1.

In contrast, the device of Carolla et al. fails to disclose or suggest the claimed configuration of the first and second circular arcs, as well as the claimed ratio of d/D of between 0.02 and 0.1, all of which are recited in independent Claim 1. Initially, the location of the outer side of the vehicle is not disclosed in Carolla et al. Accordingly, both land 1 and

land 9 of Figure 10 of Carolla et al. will be discussed because either one could be "located second when counted from the outer side of a vehicle."

With regard to the claimed first and second circular arcs defined in Claim 1, the Examiner referenced the teaching in Carolla et al. that the upper surfaces of each of the lands follow the formula $y = Ax^2 + Bx + C$. Accordingly, Applicant will discuss this formula and its application to the tread surface. Referring to the table of lines 10-20 of column 7 of Carolla et al., the values of A, B and C are provided as being the same for the first and ninth lands. Specifically, the table shows that A equals -0.1230, B equals 0.1239 and C equals 0.0005. Further, column 7 (line 23) discloses that the lands are each 1 inch wide. Thus, the following points on the x-y axis of Figure 10 result from the formula $y = -0.1230\,x^2 + 0.1239\,x + 0.0005$ for the x values of zero (left edge of land), 0.5 inch (middle of land) and 1 inch (right edge of land):

X Value	Y Value
0 (left edge of lands 1 and 9)	0.0005 inch
0.5 inch (center of lands 1 and 9)	0.317 inch (maximum amplitude)
1.0 inch (right edge of lands 1 and 9)	0.0014 inch

Column 7 (lines 42-45) of Carolla et al. indicates that the lands of Figure 10 are each of a height "h" that is equal to 0.25 inches. Applying the values of x, y and h to the ratio d/D of Claim 1 results in the ratio d/D of 0.0005/0.25 = 0.002 for land 1 and 0.0014/0.25 = 0.0016 for land 9. Neither the value 0.002 nor the value 0.0016 is even close to the claimed

range of 0.02 to 0.1, but instead both values are less than the claimed values by about a factor of ten.[1] Accordingly for at least this reason, Applicant respectfully requests the withdrawal of this §102(b) rejection of independent Claim 1 and associated dependent Claims 5 and 6.

Similarly, the Carolla et al. reference also fails to disclose or suggest the invention defined in independent Claim 8, which also includes the claimed range of 0.02 to 0.1 for the ratio d/D, except in Claim 8 the configuration of the outer end of the second land is defined as being a "curved line" (instead of a "second circular arc," as recited in Claim 1). One example of an embodiment of the invention defined in Claim 8 is shown in Applicant's Figure 4. To aid in the Examiner's understanding of Claim 8, following is an annotated version of amended Claim 8 that includes bracketed references to the index numbers of Figures 1 and 4:

> 8. (Currently Amended) A pneumatic tire having a tread surface [1] having a plurality of main grooves [2] extending straight in a circumferential direction of the tire, land portions [3] extending in the tire circumferential direction being defined by the plurality of main grooves [2], the land portions [3] each having a ground contact surface [3x] comprising a first circular [C1] arc having a single curvature radius [RO] in tire meridian cross section,
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> wherein the ground contact surface [3x] of at least the land portion [3A] which is located second when counted from the outer side of a vehicle [M] when the tire is mounted thereon, is arranged so as to have the first circular arc [C1] and a curved line [4] connected thereto on the vehicle outer side thereof [M], wherein the curved line [4] is formed so as to extend more inwardly away from a tread surface [CO] toward the vehicle outer side [M], and wherein the ratio d/D of the depth d, from the tread surface [CO], of an intersection of the curved line [4] with a vehicle outer sidewall surface [3y] of

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1 Applicant would like to point out that the Examiner appears to be calculating the value of ratio d/D incorrectly. As seen in Applicant's Figure 1, "D" is the height of groove 2 on the outer wall of the groove (i.e., the right-hand wall of groove 2 as shown in Figure 2) and "d" is the difference between the height of inner groove wall 3y and height "D". The Examiner incorrectly considers "d" as the amplitude of the convex portion of the land and "D" as the groove depth.

the at least second land portion to the groove depth D of the main groove [2] facing to the vehicle outer sidewall surface [3y] is 0.02 to 0.1.

As can be seen from the annotated version of Claim 8, and the arguments directed to ratio d/D discussed above with regard to Claim 1, the Carolla et al. reference also fails to disclose the second land configuration and the claimed ratio d/D of between 0.02 and 0.1 recited in Claim 8. Accordingly, for at least these reasons, Applicant respectfully requests the withdrawal of this §102(b) rejection of independent Claim 8 and associated dependent Claims 10 and 11.

Claims 1, 3-8 and 10-12 stand rejected under 35 U.S.C. §103 as being unpatentable over Carolla et al. in view of United States Patent No. 5,355, 922 to Kogure et al. Applicant respectfully traverses this rejection.

Applicant respectfully submits that the cited references fail to disclose or suggest all of the features of the claimed invention. More specifically, Applicant respectfully submits that the cited references fail to disclose or suggest the claimed configurations of the outer edge of the second land portion, as well as the claimed ratio of d/D failing within the range of 0.02 to 0.1, as recited in independent Claims 1 and 8. In lines 3-9 of section 4 of page 3 of the January 9, 2007 Office Action, the Examiner includes the Kogure et al. reference in order to obtain the groove depth of 8-11 mm (0.314 – 0.433 inches). However, even assuming *arguendo* that one of ordinary skill in the art would have been motivated to modify Carolla et al. in light of Kogure et al., the claimed invention would still not result.

Initially, the Kogure et al. reference does not remedy the deficiencies described above with regard to the shape of the second land (i.e. having the outer edge of the second land portion being sunk radially inwardly with respect to the tread surface). Additionally, the deeper grooves of Kogure et al. do not result in the claimed range of 0.02 to 0.1 for d/D as recited in independent Claims 1 and 9. More specifically, using the groove depth of 0.433 inches (which is equivalent to 11 mm) in the formula d/D results in 0.00115 (i.e., 0.0005/0.433) for land 1 of Figure 10 of Carolla et al. and in 0.00323 (i.e., 0.0014/0.433) for land 9 of Figure 10 of Carolla et al. Since neither the value of 0.00115 nor the value of 0.00323 is close to the claimed range of 0.02 to 0.1 (but instead both valves are less than the claimed range by about a factor of ten), Applicant respectfully submits that the inventions of Claims 1 and 8 are not disclosed or suggested in the combination of Carolla et al. and Kogure et al. Accordingly, for at least these reasons, Applicant respectfully requests the withdrawal of this §103 rejection of independent Claims 1 and 8, and associated dependent Claims 3-7 and 10-12, under Carolla et al. and Kogure et al.

Claims 1-12 stand rejected under 35 U.S.C. §103 as being unpatentable over Carolla et al. in view of United States Patent No. 5,720,831 to Aoki et al. and United States Patent Application Publication No. 2001/054464 to Tozawa et al. Applicant respectfully traverses this rejection.

Applicant respectfully submits that the cited references fail to disclose or suggest all of the features of the claimed invention. More specifically, Applicant respectfully submits that the cited references fail to disclose or suggest the claimed configurations of the

outer edge of the second land portion, as well as the claimed ratio of d/D failing within the range of 0.02 to 0.1, as recited in independent Claims 1 and 8.

In section 5 of page 4 of the January 9, 2007 Office Action, the Examiner includes the Aoki et al. reference and the Tozawa et al. reference in order to obtain a groove as high as 15 mm (0.59 inches). However, even assuming *arguendo* that one of ordinary skill in the art would have been motivated to modify Carolla et al. in light of these references, the claimed invention would still not result.

Initially, these references do not remedy the deficiencies described above with regard to the shape of the second land (i.e. having the outer edge of the second land portion is sunk radially inwardly with respect to the tread surface). Additionally, the deeper grooves of these references do not result in the claimed range of 0.02 to 0.1 for d/D recited in independent Claims 1 and 9.

More specifically, using the groove depth of 0.59 inches (which is equivalent to 15 mm) in the formula d/D results in 0.000847 (i.e., 0.0005/0.59) for land 1 of Figure 10 of Carolla et al. and in 0.0024 (i.e., 0.0014/0.59) for land 9 of Figure 10 of Carolla et al. Since neither the value of 0.000847 nor the value of 0.0024 is close to the claimed range of 0.02 to 0.1 (but instead both valves are less than the claimed range by about a factor of ten), Applicants respectfully submits that the invention of Claims 1 and 8 is not disclosed or suggested in the combination of Carolla et al. Aoki et al. and Tozawa et al. Accordingly, for at least these reasons, Applicant respectfully requests the withdrawal of this §103 rejection of independent Claims 1 and 8, and associated dependent Claims 2-7 and 9-12.

For all of the above reasons, Applicant requests reconsideration and allowance of the claimed invention. Should the Examiner be of the opinion that a telephone conference would aid in the prosecution of the application, or that outstanding issues exist, the Examiner is invited to contact the undersigned.

Respectfully submitted,

GREER, BURNS & CRAIN, LTD.

By 
James K. Folker
Registration No. 37,538

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Suite 2500
300 South Wacker Drive
Chicago, Illinois 60606
(312) 360-0080

Customer No. 24978
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